PHMC Environmental Management Performance Report – October 2000 Section C:1 – Nuclear Material Stabilization



Section C:1 Nuclear Material Stabilization

PROJECT MANAGERS

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SUMMARY

The Nuclear Material Stabilization mission consists of the Plutonium Finishing Plant (PFP), WBS 1.4.5 and 1.4.6.1. (PBS TP05 & TP12)

NOTE: Unless otherwise noted, the Safety, Conduct of Operations, Milestone Achievement, and Cost/Schedule data contained herein is as of August 31, 2000. All other information is as of September 18, 2000 unless otherwise stated.

Through September 11, 2000, an equivalency total of 602 items of Plutonium oxides and sludges have been stabilized through thermal stabilization (125 additional items since last report). Operational improvements and process efficiencies were key to this four-fold increase over last year's production level. Additionally, limited off-site shipment of stabilized material has been initiated.

Through September 21, 2000, there have been 299 calendar days or more than 950,000 person hours without a lost workday injury since the last recorded workday injury on December 2, 1999.

Fiscal-year-to-date milestone performance (EA, DOE-HQ, and RL) shows that five of eleven milestones (46 percent) were completed on or ahead of schedule, three were completed late (27 percent), and three (27 percent) are overdue. Although two additional milestones are scheduled for completion later this fiscal year, no milestones were scheduled for completion during this report period. Further details can be found in the milestone exception report following the cost and schedule variance analysis.

ACCOMPLISHMENTS

Maintain Safe and Compliant PFP

- The Defense Nuclear Facilities Safety Board (DNFSB) noted substantial improvements in the PFP criticality safety program in the July 2000 report. They include improved independent assessment and oversight, improved training, and better contractor ownership with strong formal self assessments. Through September 21, 2000 there have been 299 calendar days, equivalent to more than 950,000 person hours, without a lost workday injury since the last recorded workday injury on December 2, 1999.
- Installation and testing of backflow preventers within the Plutonium Finishing Plant (PFP) continues. Currently backflow preventers have been installed, tested, and are operating on fire risers #5, #6 and #8. This TRP-01-511 milestone activity remains on schedule to a June 2001, completion.

Maintain Safe & Secure SNM

- Material Balance Areas (MBA) 213, 218 & 250 inventories have been completed and reconciled ahead of schedule resulting in early completion of RL milestone TRP-00-509, "Complete FY00 Annual Spent Nuclear Materials (SNM) Inventory." The milestone was completed one month ahead of the September 30, 2000, commitment.
- Preparations continue for late October shipment of High Enriched Uranium (HEU) items to the Oak Ridge National Laboratory.

Oxides/Metals/Polycubes Stabilization

- Milestone TRP-00-503, "Conduct Alloys Air Operating Plan (AOP) Environmental Protection Agency (EPA) Review and Issue the Notice of Construction (NOC)" is currently on schedule for a September 30, 2000, completion.
- Operational improvements and process efficiencies have resulted in 602 items being thermally stabilized through September 11, 2000. 518 oxide items were stabilized, 4 have been shipped offsite, and 7 metal items have been oxidized and stabilized. Since the metals were much more difficult to oxidize and stabilize than other materials, they represent an equivalent of 80 oxide items. This equates to 602 items this fiscal year and represents a four-fold increase over the FY 1999 production levels.

Solution Stabilization

• The Declaration of Readiness was issued and approval for startup from DOE-RL was received for the magnesium hydroxide [Mg(OH)₂] project on September 18, 2000 and processing began on September 20, 2000.

Residue Stabilization

Startup of the Pipe-N-Go process was initiated September 11, 2000. This milestone effort was
preceded by discussions between DOE-RL, FH and the Washington State Department of Ecology
(Ecology), that established an interim Tri-Party Agreement milestone for an April 30, 2001
completion of Rocky Flats ash packaging and also authorized temporary storage of packaged ash in
the PFP.

Project W-460

- Completion of construction punchlist items and acceptance and operational testing of the 234-5 Bagless Transfer System (BTS) is currently underway. An internal Readiness Assessment (RA) is currently scheduled for completion in late September.
- Operator training was completed in support of the projected September startup of the 234-5 BTS.

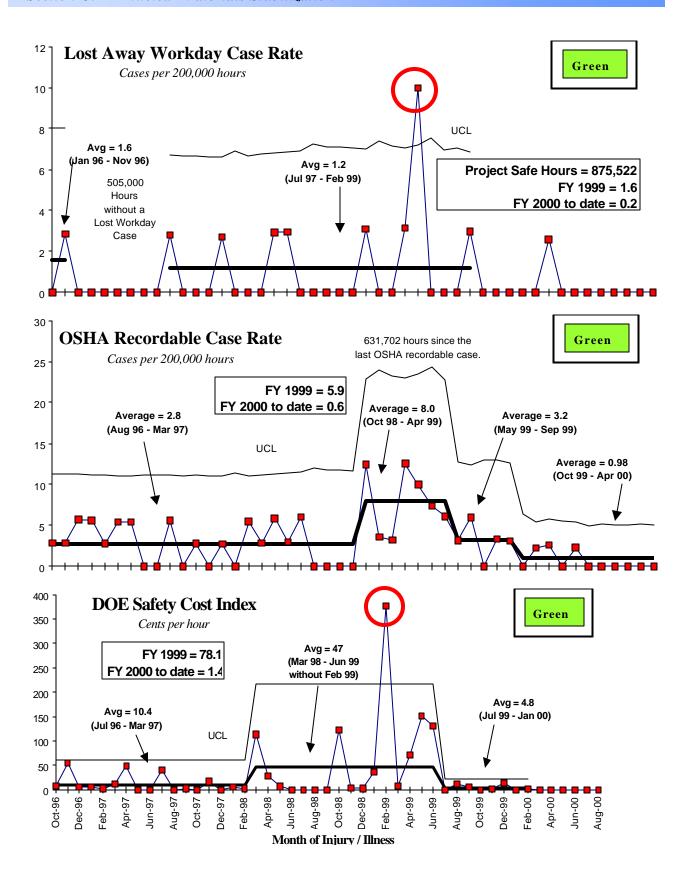
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- Westinghouse Savannah River Company (WSRC) fabrication of the 2736-ZB BTS and Outer Can Welder (OCW) remains on schedule for shipment on January 8, 2001, and February 14, 2001, respectively.
- The Notice of Construction (NOC) for the 2736-ZB Bagless Transfer System (BTS) has been modified in meetings with the Washington Department of Health and was submitted on September 20, 2000.

SAFETY

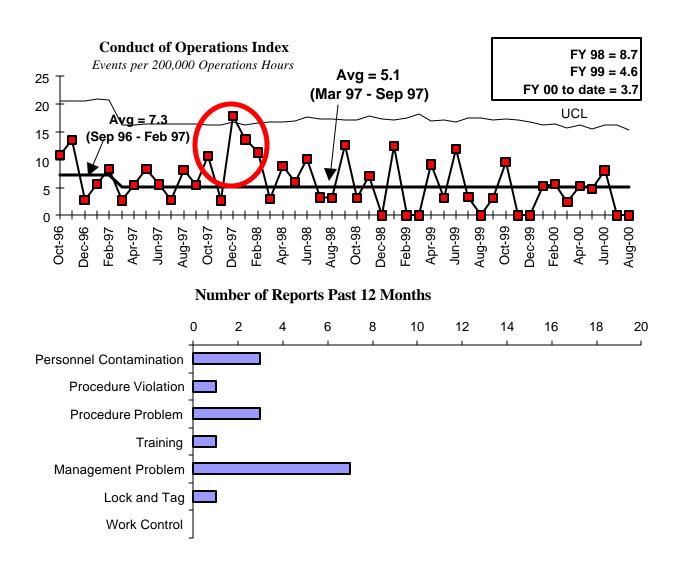
Lost Away Workday Case Rate has had a significant decrease, with thirteen of fourteen months at zero. The current rate is exceptionally low. Occupational Safety and Health Act (OSHA) recordable case rate is stable and there have been more than 631,000 hours since the last OSHA recordable case. This is a significant improvement in comparison to the adverse trend of spring 1999.

FY 2000 OSHA case rate and DOE Safety Cost Index are very favorable. DOE Safety Cost Index has been below average for eight months in a row. The Index has a new average and new control limits reflecting the significant decrease noted earlier in the year.



Conduct of Operations / ISMS Status

Green



ISMS STATUS

Green

Continued safety improvements at PFP through ISMS:

- Refinement of the Automated Job Hazards Assessment (AJHA) tool and increased worker involvement.
- Continued improvement in pre-job safety briefings.
- Improved field walk down of job sites.
- Improved metrics for work management and document development.

Breakthroughs / Opportunities for Improvement

Breakthroughs

Green

- WIPP-Validated Nondestructive Analysis (NDA) System –
 Implementation of a Waste Isolation Pilot Plant (WIPP) "validated" plutonium-measuring NDA system in FY 2000 continues. The equipment necessary to upgrade the Segmented Gamma Scanner has been delivered and upgrades were initiated.

 No further status to be provided.
- Time/Temperature Test Results for PFP Thermal Stabilization
 Furnaces This document provides the test results of the process
 currently used at the Plutonium Finishing Plant (PFP) for producing
 stable plutonium dioxide. The testing results show that the materials fed into the furnaces are being heated to at least 950°C for at least two hours as required by the Department of Energy Standard 3013-099. Testing complete no further status to be provided.
- Rocky Flats Ash Nondestructive Assay (NDA) confirmatory measurements of five (5) Rocky Flats ash standards have been completed.
 These standards will be utilized to calibrate the Segmented Gamma Scanner in support of ash repackaging via Pipe-N-Go. Pipe-N-Go process was initiated September 11, 2000.
 No further status to be provided.

Opportunities for Improvement

Green

- **Alternative Filtrate Location** Due to the temporary unavailability of 241-Z Waste Treatment Facility, an alternate filtrate loading station was identified in the 234-5ZB tunnel area. Operational readiness of the alternate loading station was achieved on September 20, 2000. *No further status to be provided.*
- Project Baseline Control A number of cost control measures are in place, and actively managed, to mitigate the current budget deficit.

 These include reductions in contract costs, overtime, material procurements, and suspension of non-critical hiring. These cost control measures implemented in FY00 will be continued in FY01. No further status to be provided.
- 2736-ZB Bagless Transfer System (BTS) and Outer Can Welder for Project W-460 Westinghouse Savannah River Company (WSRC) fabrication of the 2736-ZB BTS and Outer Can Welder (OCW) remains on schedule for shipment on January 8, 2001, and February 14, 2001, respectively. Will be statused as new developments occur.

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• **Preventive Maintenance/Surveillance Activities** – A recovery plan was developed and implemented to reduce the backlog caused by the Hanford Site fire. *No further status to be provided.*

Green

Green

• Exposure Reduction – Work continues on the ability to allow multiple tasks to be completed during a single zone entry. Ergonomic investigations reduced the likelihood of using heavy lead vests to reduce exposure. Development of new shielding and monitoring equipment continues.

UPCOMING ACTIVITIES

- Complete installation and startup of the 234-5ZB Bagless Transfer System (BTS) in September 2000.
- Begin metal stabilization processing in October 2000.
- Initiate alloys and polycube stabilization in third quarter of FY 2001.

COST PERFORMANCE (\$M):

	BCWP	ACWP	VARIANCE
Nuclear Materials Stabilization	\$106.1	\$111.8	- \$5.7

The \$5.7 million (5 percent) unfavorable cost variance is primarily driven by overruns in the Mg(OH)₂ Project where increased resources for glovebox design, procurement and installation were necessary to maintain the aggressive schedule demands. Special projects, emerging issues, and training have also contributed to this variance. The cost overruns are somewhat offset by underruns in other areas due to a staff shortage.

SCHEDULE PERFORMANCE (\$M):

	BCWP	BCWS	VARIANCE
Nuclear Materials Stabilization	\$106.1	\$117.0	- \$10.9

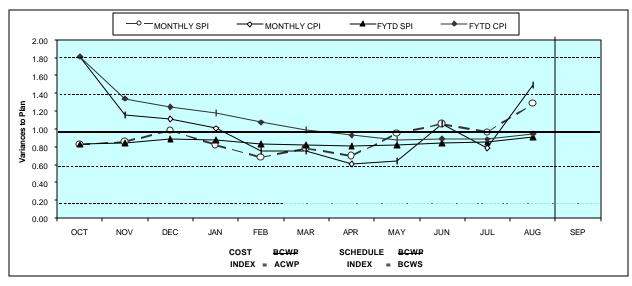
The \$10.9 million (9 percent) unfavorable schedule variance is primarily attributable to Project W-460, "Plutonium Stabilization and Packaging System." Late receipt of approval from DOE-RL and the Washington Department of Health regarding Critical Decision #3 and Notice of Construction permitting has caused significant procurement and construction delays. The Mg(OH)₂ Project is also behind schedule due to late initiation of criticality analysis and Operational Readiness Review activities. Oxide stabilization activities continue significantly ahead of schedule.

FY 2000 Cost/Schedule Performance – All Fund Types CUMULATIVE TO DATE STATUS – (\$000)

			FYTD								
В	v PBS	BCWS	BCWP	ACWP	SV	%	CV	%	PEM*	EAC	
WBS 1.4.5 PBS TP05	PFP Deactivation	\$ 117,02	5 \$ 106,082	\$ 111,762	\$ (10,934)	-9% \$	(5,681)	-5%	\$ 127,592	\$ 124,524	
	Total	\$ 117,02	5 \$ 106,082	\$ 111,762	\$ (10,934)	-9% \$	(5,681)	-5%	\$ 127,592	\$ 124,524	

^{*} Authorized baseline as per the Integrated Planning Accountability, and Budget System (IPABS) – Project Execution Module (PEM). RL-Directed Costs (steam) are included in the PEM BCWS.

COST/SCHEDULE PERFORMANCE INDICES (MONTHLY AND FYTD)



FV 2000	ОСТ	NOV	DEC	IAN	FER	MAR	ΔPR	MAV	IIIN	ш	AUG	SEP
MONTHLY SPI	0.83	0.85	0.98	0.82	0.68	0.78	0.70	0.95	1.06	0.96	1.28	
MONTHLY CPI	1.81	1.16	1.11	1.01	0.75	0.75	0.61	0.64	1.06	0.79	1.49	
FYTD SPI	0.83	0.84	0.89	0.87	0.83	0.82	0.81	0.82	0.85	0.85	0.91	
FYTD CPI	1.81	1.34	1.25	1.18	1.07	0.99	0.93	0.87	0.89	0.88	0.95	
MONTHLY BCWS	\$7.913	\$12,725	\$9,999	\$10.540	\$11.128	\$13,401	\$9.632	\$9,999	\$9,375	\$7,978	\$14.326	\$10.577
MONTHLY BCWP	\$6.543	\$10.873	\$9.849	\$8.638	\$7,567	\$10,480	\$6,704	\$9,474	\$9.910	\$7,664	\$18.379	
MONTHLY ACWP	\$3,613	\$9,386	\$8.845	\$8.587	\$10.085	\$13,961	\$10.988	\$14.826	\$9.383	\$9,753	\$12,335	
FYTD BCWS	\$7.913	\$20.638	\$30.637	\$41.177	\$52,305	\$65,706	\$75,338	\$85,336	\$94,711	\$102,690	\$117.015	\$127.592
FYTD BCWP	\$6.543	\$17,416	\$27,265	\$35,903	\$43,470	\$53,950	\$60.654	\$70.128	\$80.038	\$87,702	\$106.082	
FYTD ACWP	\$3,613	\$12 999	\$21.844	\$30,431	\$40.516	\$54 477	\$65,465	\$80,292	\$89 675	\$99 427	\$111.762	

COST VARIANCE ANALYSIS: (- \$5.7M)

WBS/PBS <u>Title</u>

1.4.5.1.11/TP05 Maintain Safe & Compliant PFP (-\$1.8M)

Description and Cause: The cost variance is attributable to emergent workscope, special projects, and overtime usage created by a shortage of staff.

Impact: Special project upgrade activities (i.e. transformer and lighting upgrade) will be delayed into FY 2001.

Corrective Action: Continue aggressive monitoring of cost control measures identified by the PFP Financial Integration & Administration organization and implemented by Project Management.

1.4.5.1.13/TP05 Stabilization of Nuclear Materials (-\$5.4M)

Description and Cause: The unfavorable cost variance is due to additional resources required to support incremental design and installation workscope associated with the Mg(OH)₂ project that was not in the original basis of estimate.

Impact: Delays in construction activities have occurred that may impact overall project funding. **Corrective Action:** Baseline Change Request FSP-2000-088, when approved, will moderate this cost variance.

1.4.5.1.15/TP05 Transition PFP (-\$0.4M)

Description and Cause: Carryover scope from FY99 (Sampling follow-on, NDA); unforeseen lab costs due to PCBs; evaluation of remedial alternatives.

Impact: Deferred tank characterization until FY 2001, no major impacts identified.

Corrective Action: BCR FSP-2000-035, "FY 2000 Carryover" funding of \$395K, using FY 1999 carryover funds, was implemented this month creating the positive cost variance. Balance is on funds management. Stopped work on largest remaining contract, minimal effort and cost for balance of FY.

SCHEDULE VARIANCE ANALYSIS: (- \$10.9M)

WBS/PBS Title

1.4.5.1.11/TP05 Maintain Safe & Compliant PFP (-\$0.4M)

Description and Cause: The unfavorable cost variance is due to transformer procurement delays that have since been resolved.

Impact: Late FY2000 delivery will result in deferring transformer installation to FY 2001.

Corrective Action: None required.

1.4.5.1.13/TP05 Stabilize SNM (-\$1.2M)

Description and Cause: The unfavorable schedule variance is due primarily to the behind schedule status on solutions and residue stabilization activities. Solution stabilization construction activities remain two months behind schedule with startup now planned for late September 2000. Priority of residue stabilization activities is being modified from the baseline plan. Pipe-N-Go processing of Rocky Flats

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Ash has now become the number one priority rather than cementation of Sand, Slag, and Crucible (SS&C) material as previously identified in the baseline plan.

Impact: Delays in startup of Rocky Flats Ash residue processing and Mg(OH) ₂ precipitation processing have been encountered. However, residue processing was initiated on September 11, 2000 and startup of the Mg(OH) ₂ precipitation process is expected by the end of FY 2000.

Corrective Action: Baseline Change Request FSP-2000-062 is in progress that establishes the updated priority of residue processing that will, upon approval, adjust the baseline to support Pipe-N-Go processing over cementation. Startup of Pipe-N-Go processing is now occurring in September.

1.4.5.1.14/TP05 Disposition of Nuclear Material (-\$9.3M)

Description and Cause: The unfavorable schedule variance is primarily due to delays in Line Item Project W-460, Plutonium Stabilization and Packaging System, definitive design and construction. Facility construction modifications in 2736-ZB have been impacted by delays in receiving Washington Department of Health (WSDOH) approval for the Notice of Construction. **Impact:** Potential delay in the startup of the Bagless Transfer and Stabilization system in 2736-ZB, which may impact stabilization objectives in FY 2001.

Corrective Action: Baseline Change Requests FSP-2000-050 and 063, when approved, will re-align workscope from FY 2000 into FY 2001. Additionally, a second BTS unit is being installed in the 234-5ZB facility and is expected to be operational prior to the close of FY 2000.

FUNDS MANAGEMENT FUNDS VS SPENDING FORECAST (\$000) FY TO DATE THROUGH AUGUST 2000 (FLUOR HANFORD, INC. ONLY)

	Project Completion *			Post 2006 *			Line Items *		
	Expected Funds	FYSF	Variance	Expected Funds	FYSF	Variance	Expected Funds	FYSF	Variance
The Plateau									
1.4.5 Nuclear Materials Stabilization									
TP05 Onerating	113 389	116 385	(2 996)						
Line Item							18.672	10.458	8,214
Total Nuclear Mat. Stab. Operating	\$ 113.389	\$ 116.385	\$ (2.996)					,	ŕ
Total Nuclear Mat. Stab. Line Item	·	•	,				\$ 18.672	\$ 10.458	\$ 8214

^{*} Control Point

PFP is proactively monitoring cost controls that were implemented earlier this year to reduce the funds and FYSF delta.

ISSUES

Technical Issues

None to report.

DOE/Regulator/External Issues

- RCRA Permitting Part A revision for adding ignitability waste code was submitted to Ecology in support of Cementation startup.
- RCRA Permitting in support of Pipe-N-Go:
- A revised Notice of Intent (NOI) to define storage locations at Plutonium Finishing Plant (PFP) was released for public review.
- The required interim status Cementation documents, necessary to work under a Part A RCRA
 permit, have been completed and were submitted by RL to Ecology on July 20, 2000. These
 documents include inspection, waste analysis, training, emergency/contingency and closure plans.
 Revised Part A to provide permitted storage at PFP has been transmitted to Ecology. Approval of
 Part A by Ecology is required prior to startup.
- Update interface agreement between PFP and Waste Management to define requirements and responsibilities to support CWC and Waste Isolation Pilot Plant acceptance of packaged residues.
- The PFP has requested DOE-RL's assistance in expediting development of the Safety Analysis for Packaging Report (SARP) or Safety Evaluation for Packaging (SEP) required for transporting pipe overpack containers (POCs) from PFP to the Central Waste Complex.
- In a letter delivered to RL on August 15, 2000, NMS was informed that its Part A, form 3 request submitted to Ecology was denied. This request was submitted to establish permitted areas where Rocky Flats ash residues could be repackaged and temporarily stored, pending shipment to an already-permitted location in the CWC. Further negotiations with the Washington State Department of Ecology, RL, and Fluor Hanford resulted in a path forward that allowed a September 11, 2000 startup of the Pipe-N-Go process. **This item is closed.**

BASELINE CHANGE REQUESTS CURRENTLY IN PROCESS (\$000) MILESTONE ACHIEVEMENT

		FISCAL YE <i>F</i>	\R-TO-DATE	REMAII				
MILESTONE TYPE	Completed Early	Completed On Schedule	Completed Late	Overdue	Forecast Early	Forecast On Schedule	Forecast Late	TOTAL FY 2000
Enforceable Agreement	1	1	0	0	0	0	0	2
DOE-HQ	0	0	0	1	0	0	0	1
RL	3	0	3	2	0	2	0	10
Total Project	4	1	3	3	0	2	0	13

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Only TPA/EA milestones and all FY2000 overdue and forecast late milestones are addressed in this report. Milestones overdue are deleted from the Milestone Exception Report once they are completed. The following chart summarizes the FY2000 TPA/EA milestone achievement and a Milestone Exception Report follows.

Tri-Party Agreement / EA Milestones

Tri-Party Agreement Milestone M-15-37A (TRP-00-501), "**Deliver Two (2) Tank Z-241-Z-361 Core Samples to 222-S**", due 10/30/99

Green

• Completed 1 month early (9/28/99)

Tri-Party Agreement Milestone M-015-37B (TRP-00-511), "**Deliver Core Sample Data Packages for Tank 241-Z-361 Disp**", due 5/31/00

Green

• Completed On Schedule

DNFSB Commitments

DNFSB Milestone IP-113 (TRP-00-500), "Install 2 LANL Pyrolysis Units for Stabilization of Polycubes at PFP", due 12/31/99

Green

• Alternative path forward using PFP muffle furnaces evaluated. Thermal Stabilization testing at Hanford's Pacific Northwest National Laboratory and PFP's Plutonium Process Support Laboratories completed, consistent with approved change request. Path forward recommendation issued to use direct thermal stabilization process versus pyrolysis.

Letter issued to RL indicating milestone will not be met. (No significant impact to overall stabilization will result, as alternative method being implemented instead).

MILESTONE EXCEPTION REPORT

Number/WBS Level Milestone Title Baseline Forecast

Date Date

Overdue -3

TRP-00-500 HQ Install Two Los Alamos National 12/31/99 Deleted

1.4.5 Laboratory (LANL) Pyrolysis Units for

Stabilization of Polycubes

Cause: See DNFSB Commitment above.

Corrective Action: A BCR to remove pyrolysis stabilization of polycubes and implement thermal stabilization in its stead has been approved by RL and implemented into the baseline. However, this is a HQ milestone and cannot be removed from the list.

TRP-00-504 RL Restart Cementation Operations 04/21/00 FY 2001

1.4.5

Cause: Stabilization processing has been re-sequenced, while 29 Kg bulk residue is still planned to be dispositioned in FY 2000. This milestone will not be met; however, there is no significant impact.

Corrective Action: None, as the global stabilization end point will remain the same.

TRP-00-507 RL Begin Stabilizing Solutions via 07/25/00 09/21/00

1.4.5 $Mg(OH)_2$ precipitation

Cause: FY 1999 funding issue impacted original baseline schedule.

Corrective Action: None.

FY 1999 OVERDUE - 2

TRP-99-419 RL Complete Installation of Production 09/30/99 Proposed 1.4.5 Scale Vertical Calciner Deletion

Cause: The production scale vertical calciner has been replaced with the Magnesium Hydroxide

Precipitation process.

Impact: No impact. This milestone is obsolete.

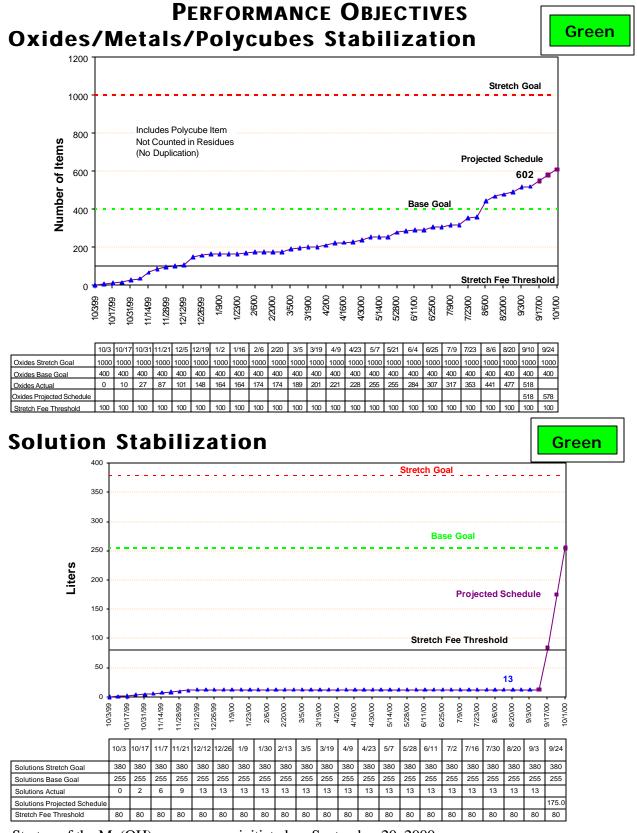
Corrective Action: Since installation and testing of the production scale vertical calciner is an EM-65 Management Commitment, the Department of Energy, Richland Office (DOE-RL) change control process cannot remove this milestone.

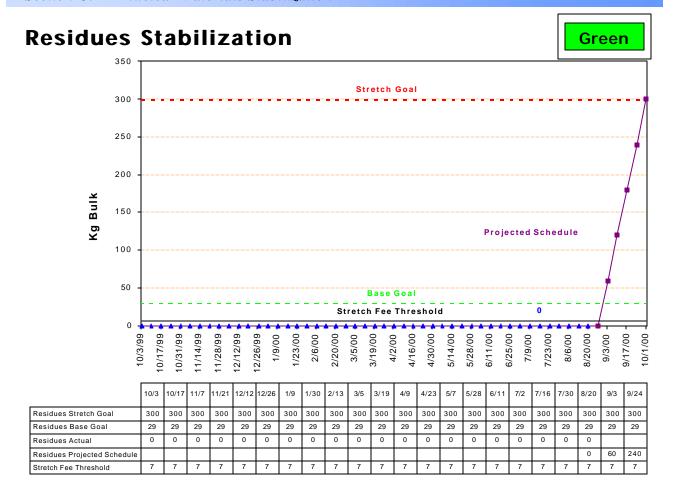
TRP-99-500 HQ Complete Installation & Testing of 09/30/99 Proposed 1.4.5 Production Vertical Calciner Deletion

Cause: The production scale vertical calciner has been replaced with the Magnesium Hydroxide Precipitation process.

Impact: No impact. This milestone is obsolete.

Corrective Action: Since this milestone is a DOE-HQ milestone and is part of the DOE-HQ 1998 DNFSB Recommendation 94-1 Implementation Plan, the Department of Energy, Richland Office change control process cannot remove this milestone. However, this milestone will be removed upon approval of the revised DOE-HQ DNFSB Recommendation 94-1 Implementation Plan.





Startup of residue processing was initiated on September 11, 2000.

KEY INTEGRATION ACTIVITIES

- Working on interface agreement between PFP and Waste Management to define requirements and responsibilities to support Central Waste Complex (CWC) and Waste Isolation Pilot Plant (WIPP) acceptance of packaged residues. This support includes security upgrades and issuance of Criticality Safety Evaluation (CSER) and Safety Analysis Report for Packaging (SARP) documentation.
- Joint PNNL/Plutonium Process Support Laboratories (PPSL) Mg(OH)₂ continues:
 - Status meeting with PNNL, PFP and DOE RL.
 - PPSL preparing to conduct scale testing with test set up developed by PNNL.
 - Downloaded solutions (1 product receiver (PR) container) in room 227 to support Phase II testing by PPSL.
- Fluor Hanford and Westinghouse Savannah River continue development and exploration of potential avenues for accelerated delivery of the Outer Can Welder (OCW) that will help standardize welding of 3013 containers (Department of Energy Standard 3013-99).